Palladium
MAKE IT POSSIBLE

How can control group and stopping guideline approaches from clinical trials be applied when evaluating behavioural interventions?

Dr Elissa Mortimer

APAC Lead - MERL

Acknowledgement of Country

We acknowledge Aboriginal and Torres Strait Islander people as the traditional custodians of the land in which we meet.

We pay our respects to the Elders of the past, present and future.

Overview

01 Context

02 Control groups

03 Stopping guidelines

04 Translation opportunities

05 Q&A

Context

- Australian government-funded programs are being encouraged to apply experimental and quasi-experimental evaluation methods to increase rigour and enable the strongest justification for programming investment decisions[1].

- Randomised Controlled Trials (RCTs) provide the most scientifically rigorous method to determine causality and therefore impact (rather than just correlation)

- In an RCT, participants are randomly assigned to either an intervention group(s) or a control group.

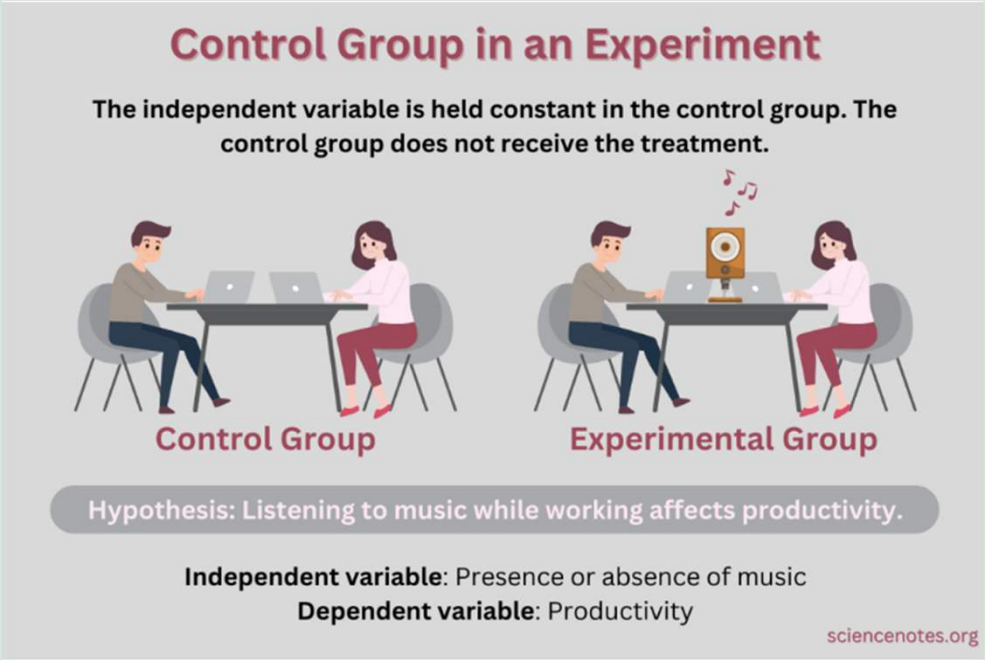
Rationale and objective

- Studies using control groups sometimes raise ethical questions as one group of participants can be perceived to have missed out.

- How can we apply learnings from clinical trials and implement them in social and behavioural evaluation to strengthen the ethical foundation of our practice?

Control groups

- A clinical trial is a research study that prospectively assigns human participants to a health-related intervention to evaluate the effects on outcomes and typically uses a control group as the comparator[3]. e.g. RCT.
- Control group and the intervention group should be identical except that the intervention group receives the intervention which is being tested.
- Achieving two groups which are (statistically) identical relies on the study's inclusion and exclusion criteria and randomisation.
- Significance testing relies on a minimum number of participants, based on effect sizes from other studies[4].



Control group types (1)

- The following 3 examples[5] translate to:

'**Between participant' evaluation designs**:

1. **'No treatment' control:**

- A group that receives no intervention

2. **Placebo control:**

- A group that receives a sham intervention (like a sugar pill) to account for the psychological effects of receiving any treatment.

3. **Active or standard-of-care control:**

- A group that receives an existing, known-to-be-effective treatment or intervention.

Example – The RISC study[6]

De Zylva *et al.*
Addiction Science & Clinical Practice (2023) 18:7
https://doi.org/10.1186/s13722-022-00355-w

Addiction Science & Clinical Practice

STUDY PROTOCOL Open Access

Efficacy of mindfulness and goal setting interventions for increasing resilience and reducing smoking in lower socio-economic groups: randomised controlled trial protocol

Reece De Zylva[1*], Elissa Mortimer[1,2], Emma Miller[3], George Tsourtos[2], Sharon Lawn[2], Carlene Wilson[2,4,5], Jonathan Karnon[2], Richard Woodman[2] and Paul Ward[1]

Abstract

Background Smoking and resulting health problems disproportionately impact low socioeconomic status (SES) individuals. Building resilience presents an approach to 'closing the gap'. Mindfulness-based interventions and setting realistic goals are preferred in low socioeconomic communities. We aim to test if these interventions, delivered online and consolidated with peer support offered via ex-smokers, are successful in promoting smoking cessation and resilience. Our conceptualisation of resilience encompasses the inner capacity/skills and external resources (e.g., social support) which smokers utilise to bounce back from adversity. We include a process evaluation of barriers/facilitators to interventions and cost-effectiveness analysis (from health system perspective).

Methods We plan a four-arm parallel 12-month RCT with a 6-month follow-up to test the efficacy of three group-based interventions each followed by peer support. Arm 1: mindfulness-integrated cognitive behavioural therapy; Arm 2: mindfulness training; Arm 3: setting realistic goals; Arm 4: active control group directed to quit services. All interventions will be administered online. Participants are adult smokers in Australia (N = 812) who have an average weekly household income less than $457AUD or receive welfare benefits. Group-based interventions will occur over 6 months, followed by 6 months of forum-based peer support. Primary outcome: self-reported 14-day period prevalence of smoking abstinence at 6 months, with remote biochemical verification of saliva cotinine (< 30 ng/mL). Secondary outcomes include: internal resilience (Connor-Davidson Resilience Scale-25); external resilience (ENRICHD social support tool); quality adjusted life years (EQ-5D-5L); self-efficacy for smoking abstinence (Smoking-Abstinence Self-Efficacy Questionnaire); motivation to quit smoking (Biener and Abrams Contemplation Ladder); nicotine dependence (Fagerstrom Test for Nicotine Dependency); equanimity (Equanimity Scale-16); stress (Perceived Stress Scale-10); goal assessment/attainment (Problems and Goals Assessment Scale).

Discussion This study is the first to compare resilience interventions for low SES smokers which have been identified by them as acceptable. Our various repeated measures and process evaluation will facilitate exploration of mechanisms of impact. We intervene within the novel framework of the Psychosocial Model of Resilience, applying a promising paradigm to address a critical and inequitable public health problem.

Control group types (2)

4. Within-participant control:

- Participants are compared to themselves at different time points (e.g pre and post data).

Stopping rules/guidelines[7-9]

Definition

- Stopping guidelines in RCTs, are predefined rules that determine when an experiment should be terminated early.

- In clinical research, stopping guidelines are used to discontinue a group either:
  - 1.) where there is identified harm/risk of harm;
  - 2.) where there is evidence confirming a superior effect in one group over another.

Ethical concerns - finding the balance[7-9]

The decision to stop a trial early requires careful evaluation of the potential benefits and harms, considering the impact on both current trial participants and future participants. This is both an ethical and VfM imperative!

Protecting patients from harm: Early stopping rules, particularly for benefit, can prevent patients in the control group from being exposed to an inferior treatment for an extended period.

Ensuring trial integrity: Conversely, stopping a trial early can compromise the statistical power of the study because the minimum number of participants is not reached, potentially leading to less reliable results. This raises concerns about the validity of the findings and their generalizability to other patient populations.

Data Monitoring Committees assess interim data and make recommendations about stopping trials. Maintains blinding for study team and provides an objective assessment of unblinded interim data.

Translation opportunities from clinical trials

Prospectively agree on stopping rules with your stakeholders so that if the monitoring data trigger the stopping rule, there will be an agreed approach. Decide the magnitude of difference of the interim data which will trigger the stopping guideline.

Consider the benefit of using a Data Monitoring Committee to enable objective decision re: discontinuation of intervention or control group.

Feedback monitoring loops used in adaptive management represent appropriate milestones for interim analysis of data.

Limited funding can be an advantage as programs are often commenced in smaller geographic regions or sub-populations. This provides an opportunity for a control group and even better if the choice can be randomised!

Acknowledgements

- Centre for Public Health, Equity and Human Flourishing (PHEHF), Torrens University

References

1. Rehill P, Slaven E, Greenwell H, Bowers P, Copley S and Williams E (2025). Randomised trials in Australian public policy: a review, the Australian Centre for Evaluation, the Australian Treasury. Randomised trials in Australian public policy: a review
2. National Health and Medical Research Council (2014). Ethical Considerations in Quality Assurance and Evaluation Activities. Canberra: ethical-considerations-in-quality-assurance-and-evaluation-activites.pdf
3. World Health Organization. International Clinical Trials Registry Platform (2025). Glossary
4. Whitley, E., Ball, J (2002). Statistics review 4: Sample size calculations. Crit Care 6, 335.
5. Malay S, Chung KC (2012). The choice of controls for providing validity and evidence in clinical research. Plast Reconstr Surg. 2012 Oct;130(4): 959-965.
6. De Zylva R, Mortimer E, Miller E, Tsourtos G, Lawn S, Wilson C, Karnon J, Woodman R, Ward P (2023). Efficacy of mindfulness and goal setting interventions for increasing resilience and reducing smoking in lower socio-economic groups: randomised controlled trial protocol. *Addiction Science & Clinical Practice,* 18:7
7. Cannistra, SA. (2004). The Ethics of Early Stopping Rules: Who Is Protecting Whom? *Journal of Clinical Oncology, Vol 22, Number 9.*
8. Tyson, J.E., Pedroza, C., Wallace, D. et al. (2016). Stopping guidelines for an effectiveness trial: what should the protocol specify?. Trials 17, 240.
9. Pocock SJ (1992). When to stop a clinical trial. British Medical Journal (BMJ). Jul 25;305(6847):235-40.

Further reading

- ACE Evaluation Library | evaluation.treasury.gov.au